

Claims:

1. A method for preparing a spray dried catalyst, comprising:
preparing a catalyst system comprising one or more components selected from the group consisting of metallocenes, non-metallocenes, and activators;
adding mineral oil to the catalyst system to form a slurry; and
adding one or more liquid alkanes having three or more carbon atoms to the slurry in an amount sufficient to reduce foaming and viscosity of the slurry.
2. The method of claim 1, wherein the viscosity of the slurry is reduced by at least 30 percent due to the addition of the one or more liquid alkanes.
3. The method of claim 1, wherein the catalyst system is a mixed catalyst system comprising at least one metallocene component and at least one non-metallocene component.
4. The method of claim 1, wherein the slurry comprises up to 20 percent by weight of the one or more liquid alkanes.
5. The method of claim 1, wherein the slurry comprises between about 2 percent by weight and 15 percent by weight of the one or more liquid alkanes.
6. The method of claim 1, wherein the slurry comprises up to 50 percent by weight of the catalyst system.
7. The method of claim 1, wherein the slurry comprises at least 10 percent by weight of the catalyst system.
8. The method of claim 1, wherein the slurry comprises from 5 percent by weight to about 35 percent by weight of the catalyst system.

9. The method of claim 1, wherein the slurry comprises from 10 percent by weight to about 30 percent by weight of the catalyst system.

10. The method of claim 1, wherein the metallocene component is represented by the formula:



wherein:

M is a metal atom;

Cp^{A} and Cp^{B} are each independently an unsubstituted or substituted cyclic ring group;

X is a leaving group; and

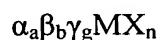
n is zero or an integer from 1 to 4.

11. The method of claim 10, wherein Cp^{A} and Cp^{B} are each independently selected from the group consisting of cyclopentadienyl, indenyl, combinations thereof, and derivatives thereof.

12. The method of claim 10, wherein M is zirconium.

13. The method of claim 10, wherein X is selected from the group consisting of amines, phosphones, ethers, carboxylates, dienes, hydrocarbyl radicals having from 1 to 20 carbon atoms, hydrides, halogens, combinations thereof, and derivatives thereof, and wherein n is 2.

14. The method of claim 1, wherein the non-metallocene component is represented by the formula:



wherein M is a metal;

X is independently selected from the group consisting of halogen ions, hydrides, C_1 to C_{12} alkyls, C_2 to C_{12} alkenyls, C_6 to C_{12} aryls, C_7 to C_{20} alkylaryls, C_1 to C_{12} alkoxys, C_6 to C_{16} aryloxys, C_7 to C_{18} alkylaryloxys, C_1 to C_{12} fluoroalkyls, C_6 to C_{12} fluoroaryls, C_1 to C_{12}

heteroatom-containing hydrocarbons, halogenated C₆ to C₁₆ aryloxys, and substituted derivatives thereof;

β and γ are groups that each comprise at least one Group 14 to Group 16 atom;

α is a linking moiety that forms a chemical bond to each of β and γ ; and

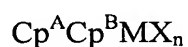
a, b, g, and n are each integers from 1 to 4.

15. The method of claim 14, wherein M is zirconium.
16. A spray dried catalyst slurry for olefin polymerization, comprising:
 - a catalyst system comprising one or more catalysts selected from the group consisting of metallocenes, non-metallocenes, and a combination thereof, wherein the catalyst system is spray dried;
 - mineral oil to form a slurry comprising the catalyst system; and
 - one or more liquid alkanes having three or more carbon atoms in an amount sufficient to reduce foaming and viscosity of the slurry.
17. The catalyst slurry of claim 16, wherein the catalyst system further comprises one or more activators.
18. The catalyst slurry of claim 16, wherein the slurry comprises up to 20 percent by weight of the one or more liquid alkanes.
19. The catalyst slurry of claim 16, wherein the slurry comprises between about 2 percent by weight and 15 percent by weight of the one or more liquid alkanes.
20. The catalyst slurry of claim 16, wherein the slurry comprises up to 50 percent by weight of the catalyst system.
21. The catalyst slurry of claim 16, wherein the slurry comprises at least 10 percent by weight of the catalyst system.

22. The catalyst slurry of claim 16, wherein the slurry comprises from 5 percent by weight to about 35 percent by weight of the catalyst system.

23. The catalyst slurry of claim 16, wherein the slurry comprises from 10 percent by weight to about 30 percent by weight of the catalyst system.

24. The catalyst slurry of claim 16, wherein the metallocene component is represented by the formula:



wherein:

M is a metal atom;

Cp^{A} and Cp^{B} are each independently an unsubstituted or substituted cyclic ring group;

X is a leaving group; and

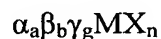
n is zero or an integer from 1 to 4.

25. The catalyst slurry of claim 24, wherein Cp^{A} and Cp^{B} are each independently selected from the group consisting of cyclopentadienyl, indenyl, combinations thereof, and derivatives thereof.

26. The catalyst slurry of claim 24, wherein M is zirconium.

27. The catalyst slurry of claim 24, wherein X is selected from the group consisting of amines, phosphones, ethers, carboxylates, dienes, hydrocarbyl radicals having from 1 to 20 carbon atoms, hydrides, halogens, combinations thereof, and derivatives thereof, and wherein n is 2.

28. The catalyst slurry of claim 16, wherein the non-metallocene component is represented by the formula:



wherein M is a metal;

X is independently selected from the group consisting of halogen ions, hydrides, C₁ to C₁₂ alkyls, C₂ to C₁₂ alkenyls, C₆ to C₁₂ aryls, C₇ to C₂₀ alkylaryls, C₁ to C₁₂ alkoxys, C₆ to C₁₆ aryloxys, C₇ to C₁₈ alkylaryloxys, C₁ to C₁₂ fluoroalkyls, C₆ to C₁₂ fluoroaryls, C₁ to C₁₂ heteroatom-containing hydrocarbons, halogenated C₆ to C₁₆ aryloxys, and substituted derivatives thereof;

β and γ are groups that each comprise at least one Group 14 to Group 16 atom;

α is a linking moiety that forms a chemical bond to each of β and γ; and

a, b, g, and n are each integers from 1 to 4.

29. The catalyst slurry of claim 28, wherein M is zirconium.
30. A method for olefin polymerization, comprising:
 - preparing a catalyst system useful for olefin polymerization;
 - adding mineral oil to the catalyst system to form a slurry;
 - adding one or more liquid alkanes having three or more carbon atoms to the slurry in an amount sufficient to reduce foaming and viscosity of the slurry; and
 - transferring the slurry to a gas phase reactor.
31. The method of claim 30, wherein the viscosity of the slurry is reduced by at least 30 percent due to the addition of the one or more liquid alkanes.
32. The method of claim 30, wherein the catalyst system is a mixed catalyst system comprising at least one metallocene component and at least one non-metallocene component.
33. The method of claim 30, wherein the slurry comprises up to 20 percent by weight of the one or more liquid alkanes.
34. The method of claim 30, wherein the slurry comprises up to 50 percent by weight of the catalyst system.

35. The method of claim 30, wherein the metallocene component is represented by the formula:



wherein:

M is a metal atom;

Cp^{A} and Cp^{B} are each independently an unsubstituted or substituted cyclic ring group;

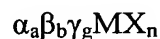
X is a leaving group; and

n is zero or an integer from 1 to 4.

36. The method of claim 35, wherein Cp^{A} and Cp^{B} are each independently selected from the group consisting of cyclopentadienyl, indenyl, combinations thereof, and derivatives thereof, and wherein M is zirconium.

37. The method of claim 35, wherein X is selected from the group consisting of amines, phosphones, ethers, carboxylates, dienes, hydrocarbyl radicals having from 1 to 20 carbon atoms, hydrides, halogens, combinations thereof, and derivatives thereof, and wherein n is 2.

38. The method of claim 30, wherein the non-metallocene component is represented by the formula:



wherein M is a metal;

X is independently selected from the group consisting of halogen ions, hydrides, C_1 to C_{12} alkyls, C_2 to C_{12} alkenyls, C_6 to C_{12} aryls, C_7 to C_{20} alkylaryls, C_1 to C_{12} alkoxys, C_6 to C_{16} aryloxys, C_7 to C_{18} alkylaryloxys, C_1 to C_{12} fluoroalkyls, C_6 to C_{12} fluoroaryls, C_1 to C_{12} heteroatom-containing hydrocarbons, halogenated C_6 to C_{16} aryloxys, and substituted derivatives thereof;

β and γ are groups that each comprise at least one Group 14 to Group 16 atom;

α is a linking moiety that forms a chemical bond to each of β and γ ; and

a, b, g, and n are each integers from 1 to 4.

39. The method of claim 38, wherein M is zirconium.